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A

UNITED STATES

RAIL TRUST FUND

PRESCRIPTION

FOR MODERN RAIL

TRANSPORTATION

MILTON J. SHAPP

GOVERNOR

COMMONWEALTH OF PENNSYLVANIA

The Rail Trust Fund: A New Future for America's Railroads

The nation's railroads are an irreplaceable public asset. For more than a century they have been the backbone of America's economy, and now, more than ever, they are essential for continued growth and prosperity.

Ironically, while we have lavished public support on the rest of our nation's transportation system, through Federal and state aid for highway, water and air transportation, we have all but ignored the railroads.

As a result, our nation's rail system is far from healthy. Neglect has been the rule rather than the exception, not just among bankrupt eastern railroads but across the nation. Deteriorating track, a chronic car shortage, and poor service have generated millions of dollars in unnecessary costs for America's shippers--and ultimately for the consumer as well.

And the rail industry itself--once a giant of profitability--is now characterized by high costs, low earnings and bankruptcy or near bankruptcy of some of its major companies.

America's railroads are at a crossroads: either a means must be found to revitalize them or the nation will be forced into a program of massive public subsidy or even outright public ownership.

The Rail Trust Fund is a proposal to overcome this neglect, to modernize and equip railroads to furnish the high quality of service the public requires.

The Rail Trust Fund is not a proposal to nationalize railroads. It is not a government takeover.

The Rail Trust Fund is not a device to restructure, merge or splinter existing railroads.

It is not a subsidy program for railroads.

Rather, it is a means of channeling about $13 billion into track and yard improvements, electrification and rolling stock purchases over a six year period. The money will come from a five percent surcharge on rail freight revenues (taking half of the recently-approved temporary ICC rate increase). The surcharge will be capitalized over 30 years so that the improvements can be completed in a matter of years - not decades.

Most of the grants from the Trust Fund will be made to railroads in proportion to the amount of the surcharge they collect. Each railroad can spend its grants on approved modernization projects, such as track, electrification, yard and terminal improvements. These will be based on the railroad's own needs and priorities.

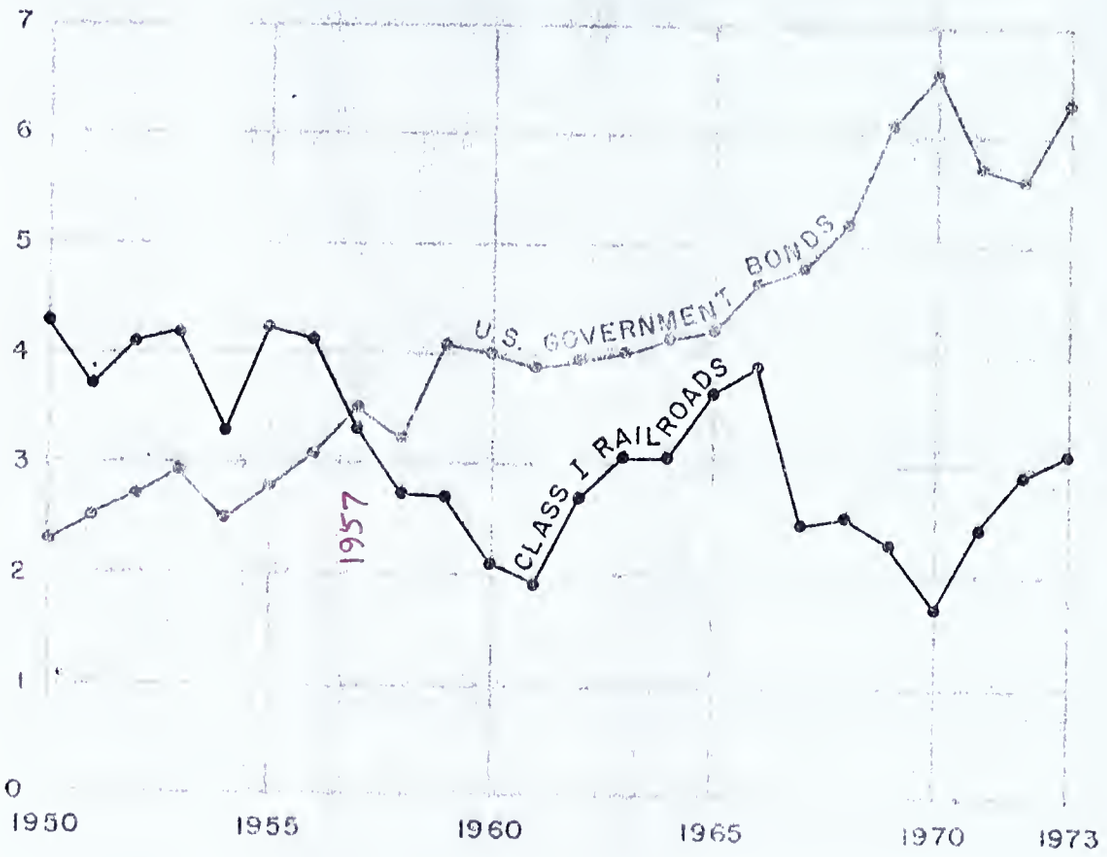
The Fund will also provide a source of low interest loans for purchase of new and rebuilt rolling stock for both railroads and their jointly-owned car pooling companies.

In many ways the Rail Trust Fund builds on the undeniable success of the Highway Trust Fund. Like the Highway Trust Fund, it provides a long-term commitment to invest in a vital segment of the transportation system. It provides a sure source of funds, just as the gasoline tax does for highways. And like the Highway Trust Fund those who benefit--the users--pay the costs.

Just as the Highway Trust Fund, from a small beginning, forged a modern, high speed road network spanning the continent, and reaching previously isolated communities, the Rail Trust Fund can provide the impetus for a modern rail network to speed the movement of goods and passengers.

The potential benefits of the Rail Trust Fund are enormous. For shippers, improved rail service using high speed main lines and modern yards and terminals will mean lower costs. Railroads can achieve renewed profitability by attracting more business and handling it less expensively. And the public can be assured of a truely balanced transportation system to carry us into the 21st century.

RETURN ON RAILROAD INVESTMENT
VERSUS RETURN ON U.S. GOVERNMENT BONDS



WHY A TRUST FUND?

The railroad industry needs more capital than it can raise in today's money markets. Projects of unquestioned financial benefit--electrification of heavily used routes, modernization of yards and terminals, acquisition of new and dependable rolling stock--are regularly postponed by railroad managements because of their limited ability to raise the necessary capital.

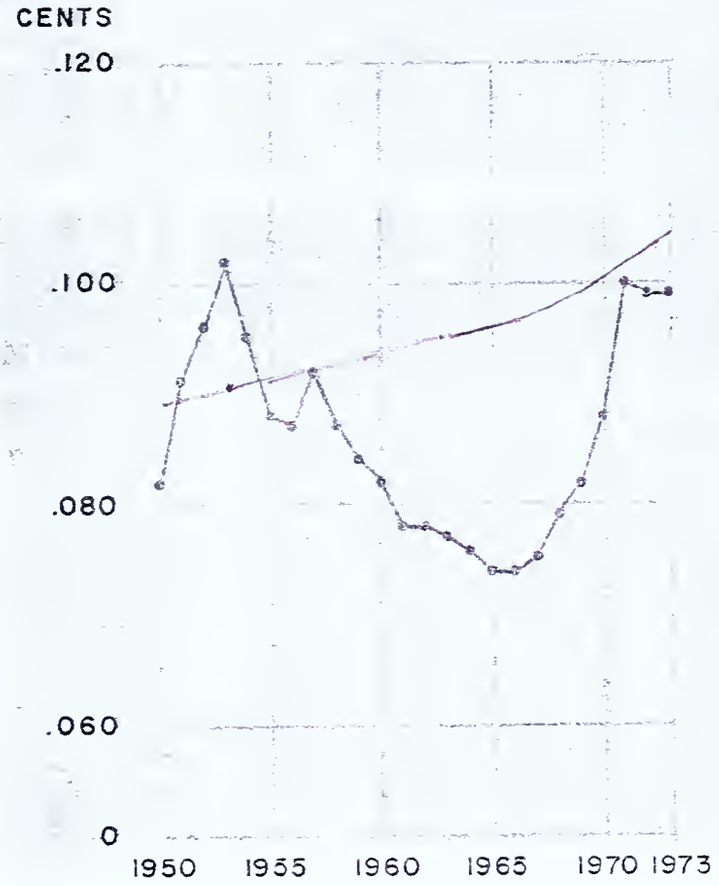
Among the reasons for this state of affairs is the low rate of return on investments in railroads. Since 1957, for example, the rate of return on capital invested in railroads has been consistently below the "no risk" average return on U. S. Government bonds.

(Graph Showing Rates of Return)

No industry can keep pace with a developing economy if it does not or cannot make the capital investments required for replacement and modernization. While there are disagreements about why railroads are in this predicament, there is wide agreement that railroads are capital starved when compared with the work they do for the nation.

This is amply demonstrated by the decline in railroad outlays for maintenance of way and capital expenditures per unit of railroad work (the gross ton mile).

OPERATING EXPENDITURES FOR MAINTENANCE OF WAY AND STRUCTURES PER GROSS TON MILE,

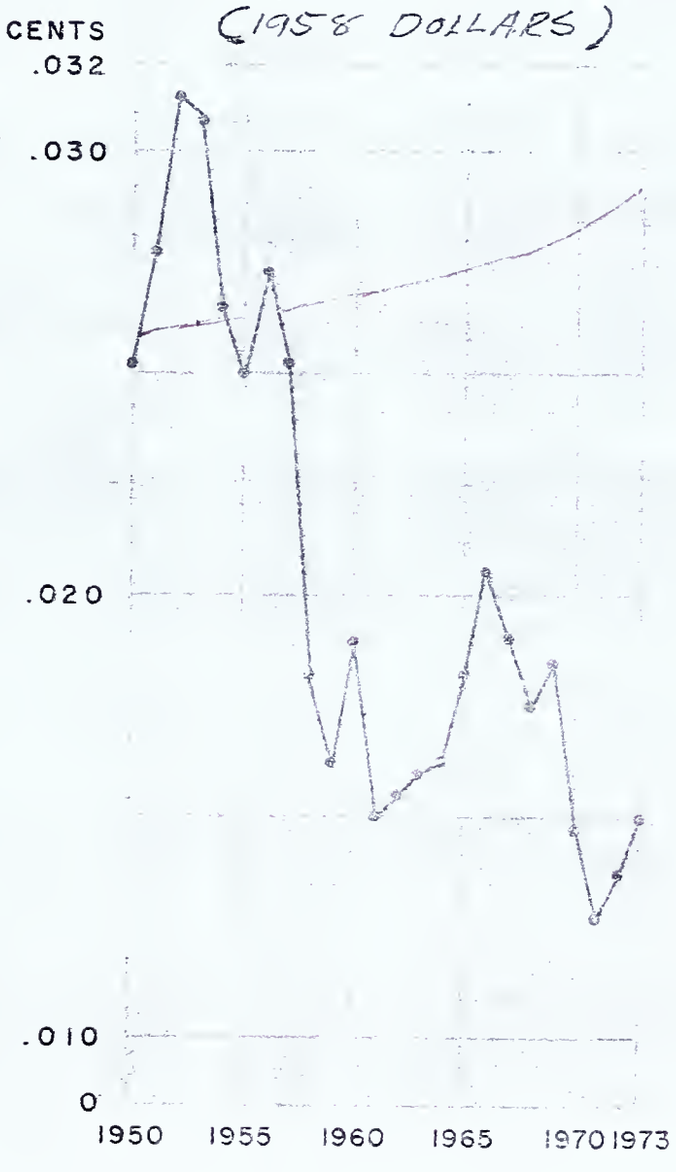


SOURCE ASSOCIATION OF AMERICAN RAILROADS
ECONOMICS AND FINANCE DEPARTMENT
WASHINGTON, D.C.

GROSS CAPITAL EXPENDITURES FOR ROADWAY AND STRUCTURES PER GROSS TON MILE

CLASS I LINE HAUL RAILROADS

(1958 DOLLARS)



SOURCE: ASSN. OF AMERICAN RAILROADS, ECONOMICS AND FINANCE DEPT. WASHINGTON, D.C.

Railroad expenditures on maintenance of way and structures per gross ton mile have declined throughout most of the fifties and sixties. Only in recent years have they begun annual maintenance efforts approximating needs. Yet the two decades of neglect are not being overcome.

(Maintenance of Way/Gross Ton Miles)

Nor during this period is it proper to assume that railroads became more capital intensive and therefore more productive so that less annual maintenance investment was required.

Capital expenditures for roadway and structures per gross ton mile have declined precipitously during this period, highlighting as perhaps no other statistic the fact that American railroads are doing more work with less investment.

(Capital per ton mile)

That railroads have continued to operate as well as they have under these circumstances can be explained less in terms of economics than by tradition, determination and igenuity of railroaders themselves.

AVERAGE TIE RENEWAL 1963 – 1972

AVERAGE TIE REPLACEMENT GREATER THAN NEEDS	AVERAGE TIE REPLACEMENT LESS THAN NEEDS
KANSAS CITY SOUTHERN MISSOURI PACIFIC NORTHWESTERN PACIFIC TEXAS & PACIFIC	24 WESTERN DISTRICT R R'S
AKRON, CANTON & YOUNGSTOWN CHICAGO & EASTERN ILLINOIS RICHMOND, FREDRICKSBURG & POTOMAC	27 EASTERN DISTRICT R R'S
FLORIDA EAST COST NORFOLK SOUTHERN SEABOARD COAST LINE SOUTHERN SYSTEM	4 SOUTHERN DISTRICT R R'S

SOURCE: INTERSTATE COMMERACE COMMISSION

The reasons for spending less for necessary upkeep are fairly simple. As most people involved with railroads know, railroad accounting conventions adopted by the Interstate Commerce Commission treat the installation of ties with a 35-year life and rail with a 60-year life as a current expense rather than as a capital investment. By contrast, under generally accepted accounting procedures a business would depreciate the value of these assets over their useful life.

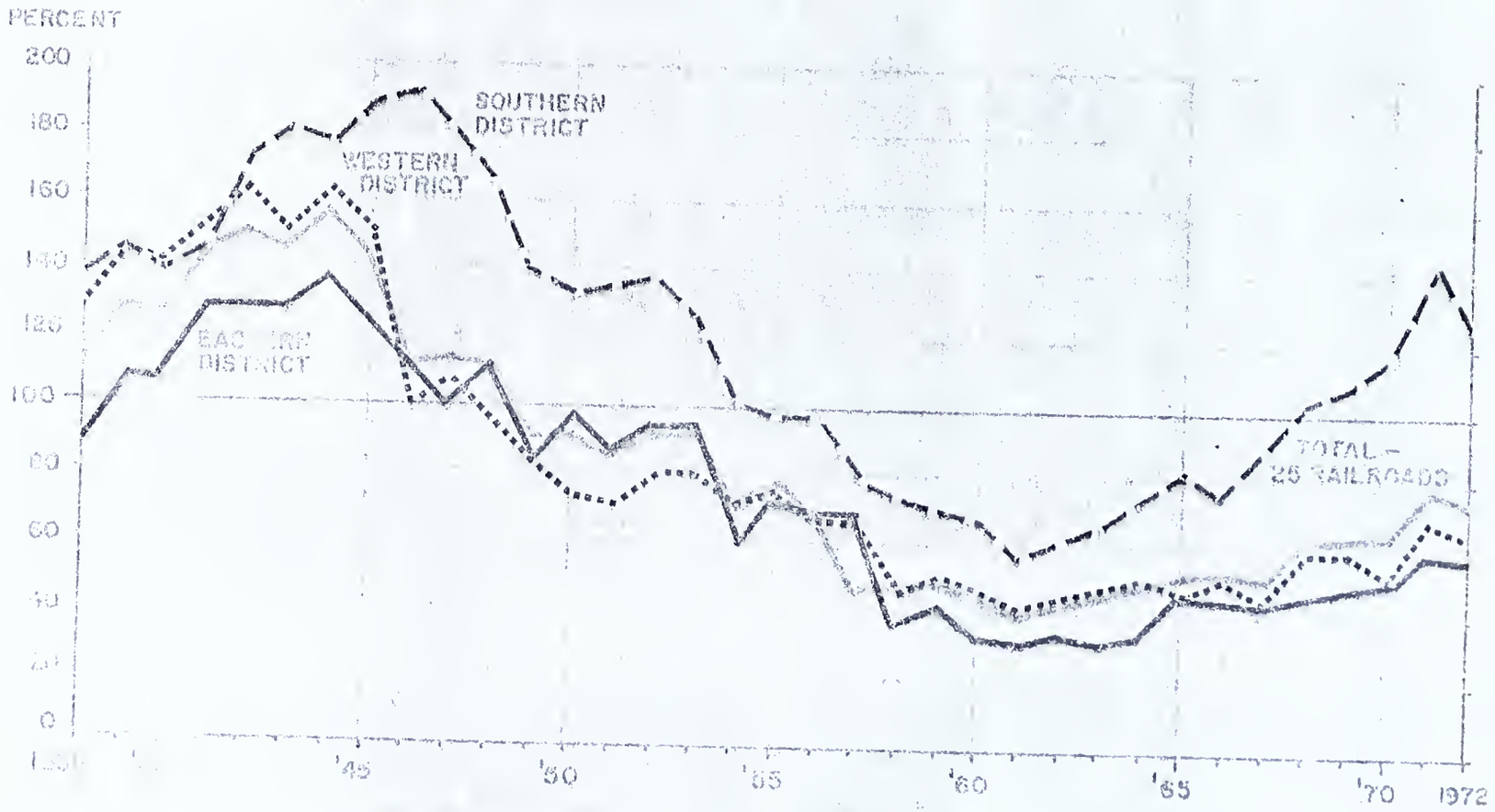
The effect of the ICC procedure has been to encourage railroads to defer necessary replacement of ties and rail in years when business in down and there might not be cash for dividends. Money that would have gone into normal and necessary maintenance is diverted to dividends so that railroads still appear attractive to investors.

This practice has fed the cancer of deferred maintenance, a problem throughout the railroad industry. In recent years only twelve of the nation's 67 Class I railroads have renewed ties at a rate greater than normal replacement needs. Since 1963 fifty-five of the nation's Class I railroads have not kept pace with their annual replacement needs.

(Box showing railroads)

Title

CROSS TIES INSTALLED AS PERCENT OF
ESTIMATED NUMBER REQUIRED (25 RAILROADS) BY DISTRICT



In a recent study of tie and rail replacement needs made for the Federal Railroad Administration by Thomas K. Dyer, Inc. twenty-five of the nation's Class I railroads (representing 71% of all Class I mileage) were analyzed. Results of that study illustrate that contrary to popular myth, the nation's railroads were well-maintained during World War II. Not until 1950 did overall tie replacement fall below normal replacement needs. Even then, Southern District railroads continued tie renewal at or above annual requirements until 1956.

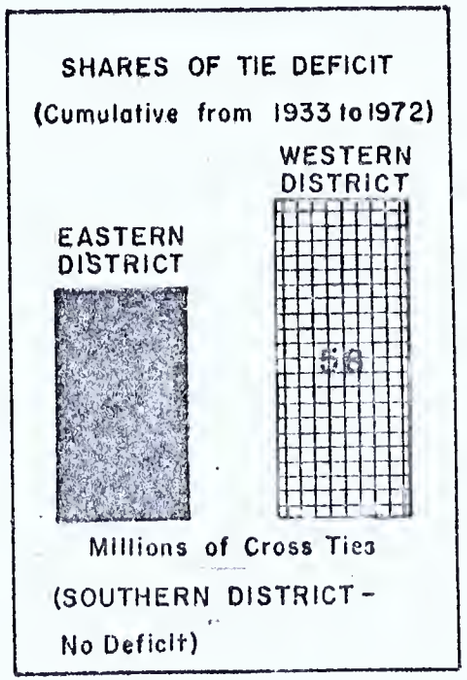
Thereafter, deferred tie replacement became a nationwide railroad malady. It is perhaps coincidental that this was the year of enactment of the Interstate Highway System which so successfully boosted truck competition.

Not until eleven years later, 1967, did the Southern District railroads again undertake large tie replacement programs, which have continued through the present period and have erased that District's tie deficit.

(Cross Ties Installed as Percent of Estimated Number Required (25 railroads) By District)

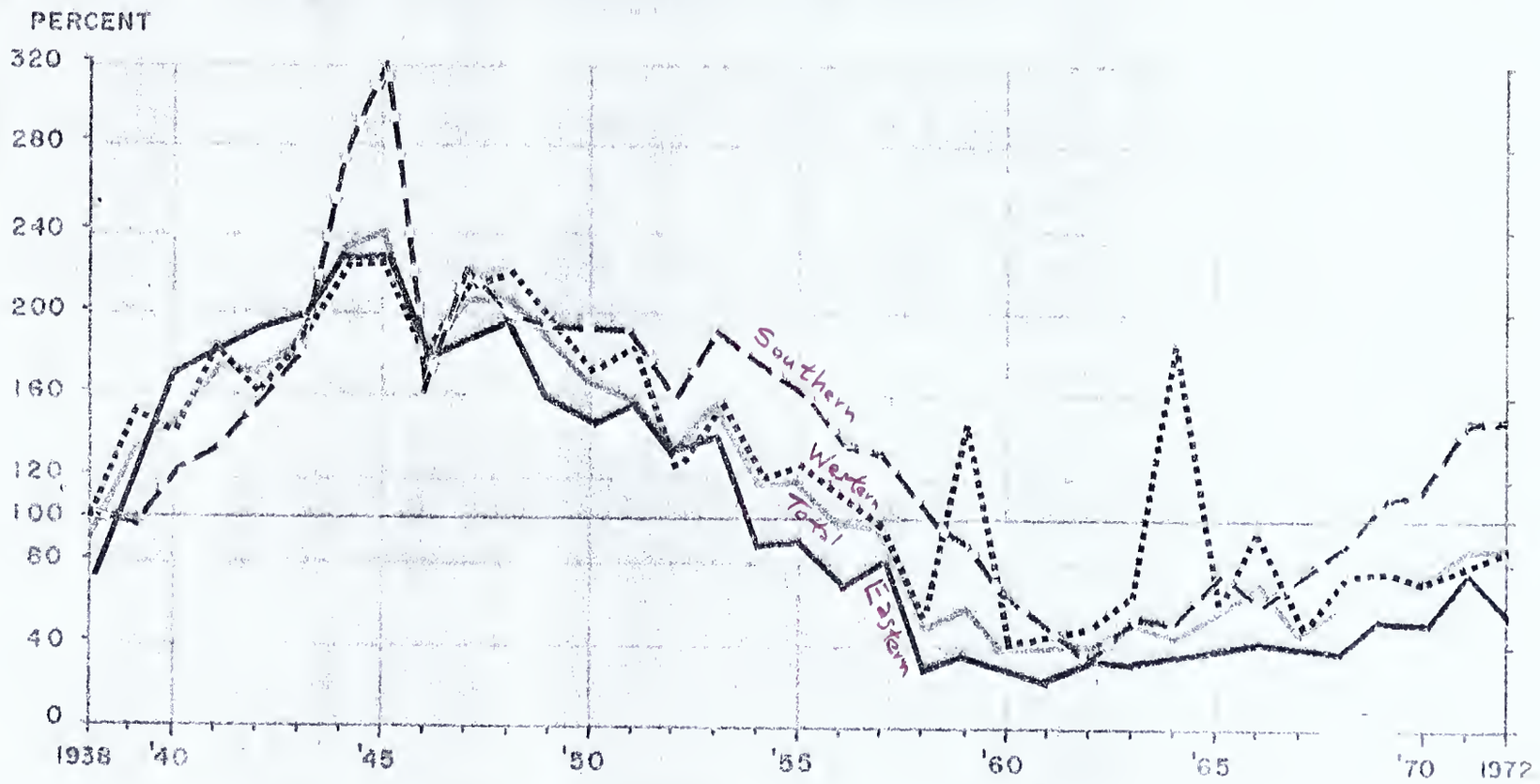
Since 1938 Western District Railroads have fallen 82.3 million ties behind in meeting normal maintenance needs while Eastern District railroads, often

CROSS TIES INSTALLED



Title

MAIN TRACK RAIL INSTALLED AS PERCENT OF NORMAL REQUIREMENT, BY DISTRICT, 1938 - 1972



MAIN TRACK RAIL INSTALLED

believed to be the most neglected, are 59.6 million ties behind in meeting normal replacement requirements. The bill for meeting this need was estimated at $3.239 billion of which the Western District railroads' share is $1.879 billion and that of Eastern railroads $1.360 billion.

(Bar Chart Showing District Shares of Tie Deficit)

The rail deficit is similar according to the same study. Again, Southern District railroads have been more aggressive in meeting replacement needs, but even they have a slight accumulated deficit. Since the late fifties, the nation's railroads have repeatedly fallen well below 100 percent of their annual requirements for replacement. In the late sixties Southern District railroads began spending more to overcome their accumulated deficit.

(Rail Installed as Percent of Need)

Measured in tons of rail required to reach a normalized condition, by 1972 the Eastern District was farthest behind, requiring 3.25 million tons which would cost an estimated $1.55 billion. Western District railroads which have a smaller deficit would still need

about 1.82 million tons of rail at a current cost of about $870 million while the Southern District railroads, with only a 233,000 ton rail deficit, can be brought up to standard for about $112 million.

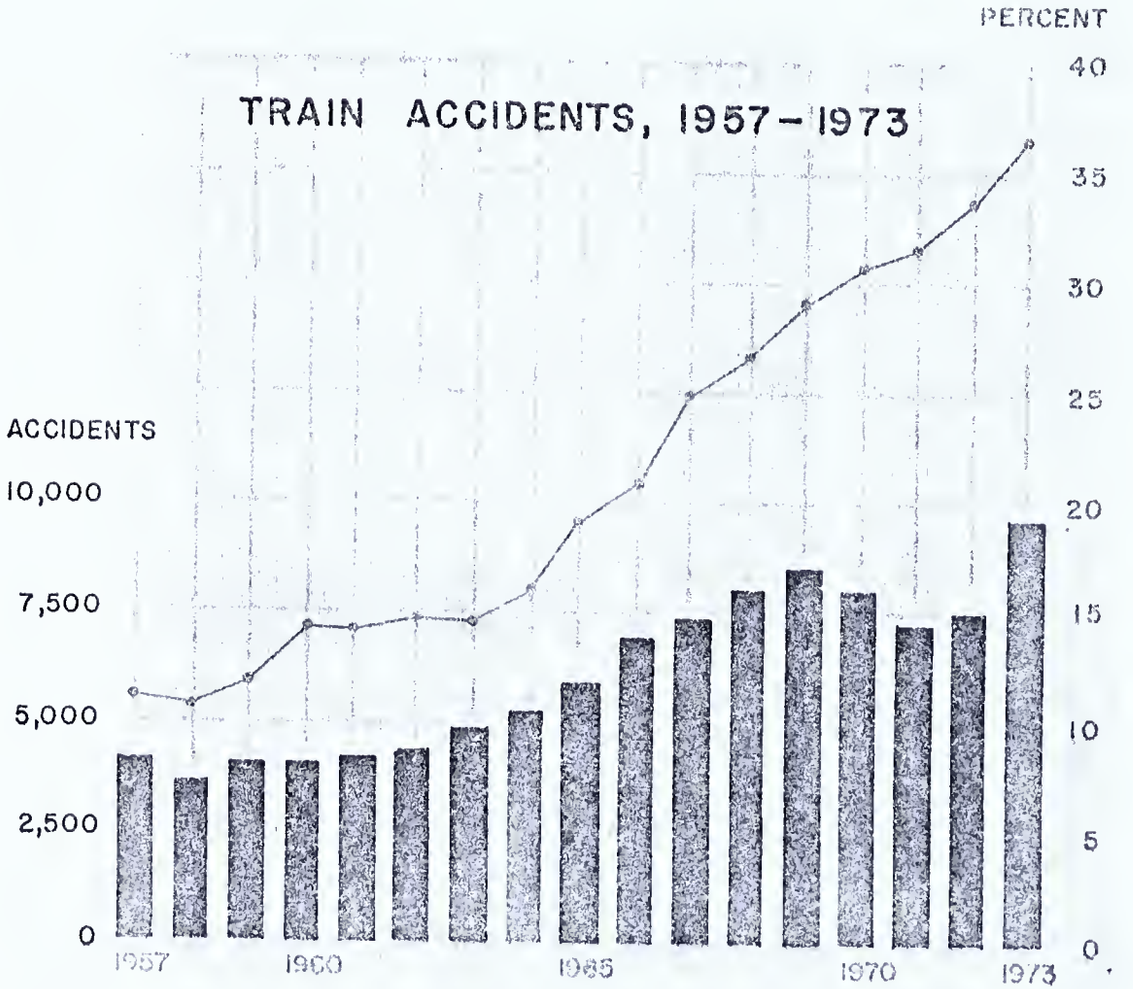
(Bar Chart Showing Regional
Shares of Rail Deficit)

Thus the nation's rail system needs today about $5.8 billion just to replace worn-out rail and ties. Inflation increases this cost daily, and the six year Rail Trust Fund program to correct this deficiency would actually cost $6.7 billion when finished. Yet this investment is needed because its absence is costly to the railroads, rail users and consumers of products moved by rail.

Train Accidents

Among the obvious effects of deferred maintenance are accidents that result from faulty equipment or inadequately maintained track and structures. Since 1957 (when definitions of accidents were changed) there has been a steady increase in the total number. Even more striking has been the increase in the proportion resulting from deficiencies in maintenance of way or structures--a rise from 11.2 percent in 1957 to 36.7 in 1973.

INCREASING SHARE OF TRAIN ACCIDENTS CAUSED BY MAINTENANCE OF WAY DEFICIENCIES

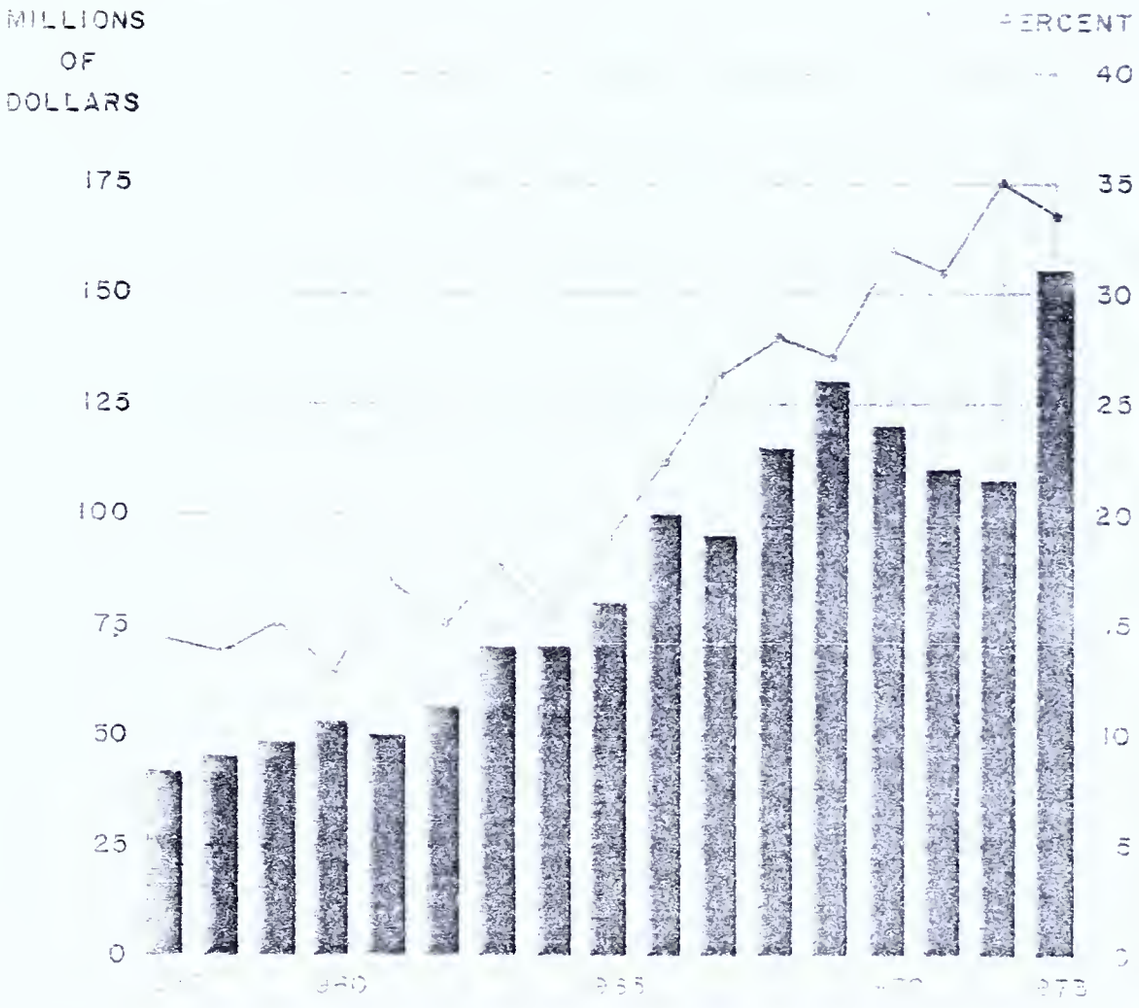


SOURCE: FEDERAL RAILROAD ADMINISTRATION "ACCIDENT BULLETIN"

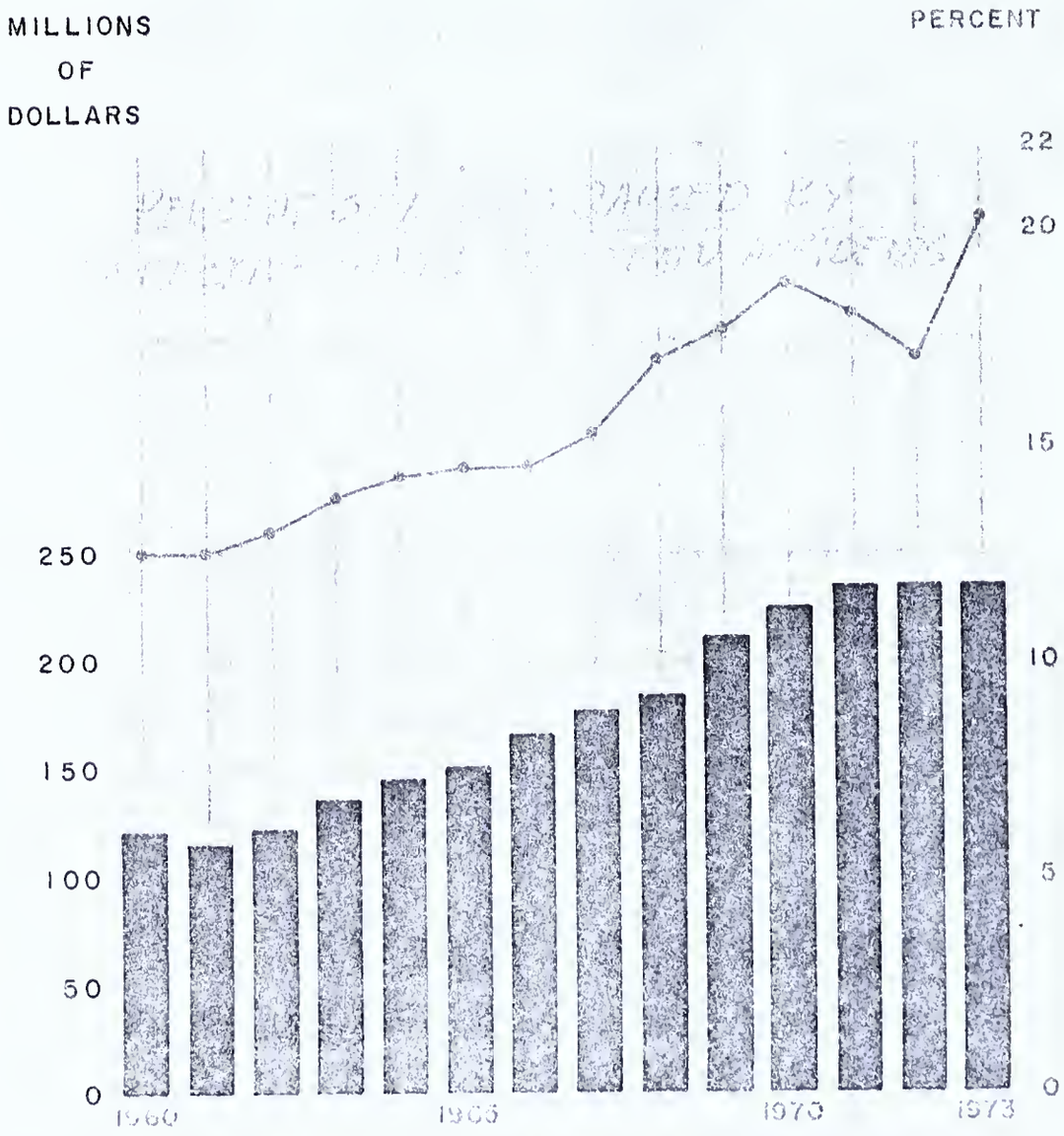
COST OF TRAIN ACCIDENTS, 1957-1973

INCREASED SHARE CAUSED BY MAINTENANCE

OF WAY DEFICIENCIES



LOSS AND DAMAGE TO FREIGHT CONTENTS



(Graph and Chart "Increasing Share of Train Accidents Caused By Maintenance of Way Deficiencies)

The increasing costs of accidents, which are reported in current dollars, are explained in part by changes in buying power of the dollar. But there is no equally simple explanation for the rising share of these costs attributed to deficiencies in maintenance of way or structures. Much of this increase is undoubtedly due to deferred maintenance.

(Graph and Chart Cost of Accidents)

In addition the American Association of Railroads maintains records on the loss and damage to the contents of trains. Here again the losses attributed to train accidents and defective units is a rising share of the total, which itself rose substantially during the sixties.

All of this accident analysis simply reinforces the knowledge that deferred maintenance and overage equipment are costly to the railroad industry and to shippers.

No One Benefits From Deferred Maintenance

When the system does not function efficiently, everyone loses: the shipper whose customer is inconvenienced,

the receiver whose business may be disrupted if products arrive damaged or late, the railroads which lose business because of customer dissatisfaction, and the general public when the costs of goods are inflated by increased transportation costs.

Many of these factors are difficult to quantify. For example, "slow orders, " the decisions to reduce speed limits on certain stretches of track for safety reasons, are known to be widespread in the Northeast, especially on Penn Central tracks. Some of these reductions are to 5 or 10 miles per hour, yet there is no readily available public documantation of where these slow orders are in effect or their cost.

For Amtrack riders who travel at 10 miles per hour through long stretches of Penn Central track in Indiana and arrive at their destination three or four hours late, the inconvenience of missed connections will always be difficult to calculate in dollars and cents.

To branch line freight users whose service is reduced from twice per week to once per week because it takes two crews to complete the round trip instead of one when speed limits were greater, the costs could be determined but it would be cheaper to improve the track than to make the necessary audits.

Rising Per Diem Payments

Another partially hidden cost is the increase in per diem payments to owners of railroad cars for the

additional time they spend on the lines of a poorly functioning railroad. While it may appear that rail car owners benefit through receiving higher rentals, there is a fundamental loss to the whole economy by having rail cars idle.

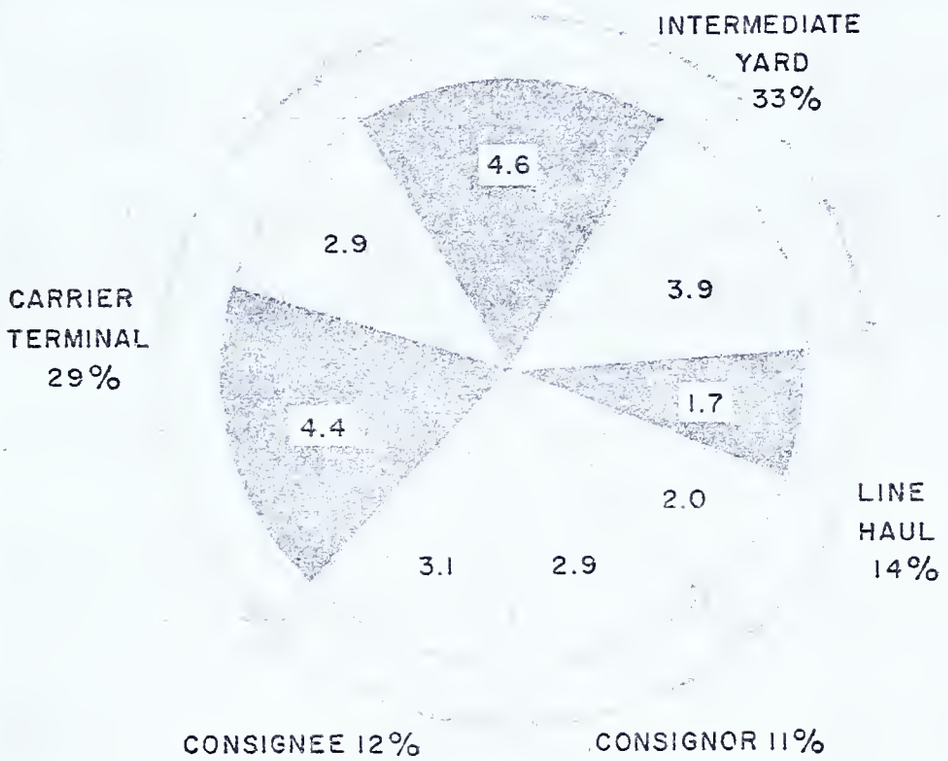
Measured as a share of net railroad operating revenue, the per diem payments of railroads increased sharply between 1960 and 1972. And while there are different explanations for this dramatically increasing trend, most of them can be reduced to two reasons: either railroads are unable to return cars efficiently to their owners, or they are unable to raise capital to purchase cars and must instead resort to use of cars owned by others to meet customers' needs.

(Graph showing net equipment and facilities rents as a percent of net revenue from railway operations)

Per diem payments for most railroads are over 90 percent of net rents for equipment and facilities. It is these car hire payments that have caused the sharp rise in equipment and facilities rents and which have resulted in large drains on railroad finances.

To be sure, the Eastern District railroads per diem payments are distorted by the huge outlays of

TYPICAL FREIGHT CAR CYCLE (IN DAYS)



TOTAL 25.6 DAYS PER CYCLE

EMPTY

Source
U.S. DEPT. OF TRANSPORTATION

Penn Central. After the merger those costs skyrocketed and even exceeded net revenues during 1970 and 1971. The resulting acceleration of these increasing costs for the Eastern District caused by Penn Central is also reflected in the nationwide increase.

But even so, all districts are experiencing an increase in per diem costs--costs which can only be controlled through restoration of decent track conditions, purchase of new equipment, and modernization of yards and terminals.

Car Shortages

While high per diem costs reflect delays in returning cars to owners, the other side of this delay is reflected in their non availability to rail users. During the sixties and seventies the average daily freight car shortage of Class I railroads has varied widely--from a low of 430 in 1972 to a high of 43,351 in March of 1974.

Over a longer period of time a study by the Federal Task Force on Railroad Productivity revealed that the typical freight car cycle has increased from 16.6 days in 1947 to 25.6 days in 1972. As the pie chart on freight car utilization shows, freight cars spend a third of their time in intermediate yards and almost as much time in carriers' terminals.

(Pie Chart Here)

Perhaps this fact, more than any other, illustrates that it is yards and terminals where deferred maintenance and the absence of modernization is costing railroads and shippers the most. Clearly, it is here that greater efficiency in the use of existing rolling stock is possible. For example, a reduction of one day in the average car cycle--from 25.6 to 24.6 days--would equal an increase of 70,000 cars to the nation's rail car supply.

An inability to raise capital has also forced railroads to skimp on expenditures for other "betterments" to roadway and structures. Some heavily used routes--often laid out a hundred years ago--are characterized by steep grades and sharp curves. Overage bridges and trestles often impede operations, and in some cases are a threat to safety as well.

Modern construction techniques could overcome many of these problems, and allow railroads to benefit from operating economies as well. But funding problems have kept many of these projects from getting past the design stage.

Railroad expenditures for all roadway and structure betterments--including those to yards and terminals--averaged $382 million in the 1969-73 period. Compared with

expenditures for "betterments" made in the 1950-54 period, which was a relatively prosperous period for railroads, these sums are substantial. But if one discounts them to account for inflation and the increased amount of work the railroads now do (the latter measured in gross ton miles), expenditures in the past several years are seriously deficient. In fact, in the past five years these real expenditures have averaged only 53 percent of those in the earlier period.

The Rail Trust Fund would provide $2.7 billion over six years to return these outlays to their previous levels. Of this, one-third, or $900 million, would be earmarked for yards and terminals and the rest for other betterments.

Car Supply Problems Cannot Wait For Modernization

While modernization of roadways, yards, and terminals will undoubtedly ease car shortages, those improvements will be years in coming. And at the same time there are other pressures on the car supply, such as the outlawing of cars over 50 years of age, which will continue to reduce the supply.

Currently, the nation's rail car manufacturers have a backlog of orders of a year or more. Car repair programs by the railroads themselves are returning some units to service and the Association of American Railroads is at work devising means of improving use among railroads.

The AAR, in testimony before the Senate's Special Subcommittee on Freight Car Shortages last year estimated the current shortage at 100,000 cars. Figures compiled by the ICC and AAR indicate shortages of more than 40,000 cars in the first quarter of this year.

It is probably impossible to get an exact accounting of the shortage--and even if one could, this would not be very useful because car availability is so closely tied with car utilization.

The Rail Trust Fund, through its Rolling Stock Revolving Loan Fund, would provide a line of low interest credit of $1 billion over the first two years to finance car and locomotive purchases. At today's prices this would pay for 20-40,000 cars and 750-2,000 locomotives depending on the mix between the two. After the first two years this line of credit could be expanded to $2 billion to finance additional rolling stock purchases.

The Rolling Stock Revolving Fund would also provide an incentive for the development of a national car pool fleet by financing railroad jointly-owned car supply companies.

The Missed Opportunity of Electrification

Among railroaders the benefits of electrification on heavily used lines are well-known. Repeatedly

ELECTRIFICATION HOLDS ENORMOUS POTENTIAL FOR IMPROVING RAIL SERVICE

Why Electrification?

For some shippers, and certainly for the general public, this is a critical question. Is electrification worth the several billion dollars it will cost?

The answer is a definite yes, and here are some of the reasons:

--electric locomotives are less expensive to operate than diesel because they need less maintenance, maintenance is less expensive, and they are more reliable.

--electric locomotives have a significant reserve potential for use on start-ups, grades and in changing speeds. The result is shorter trip times and smaller locomotive fleets.

--High speed passenger service is most effective on electrified track. This is so bacause electric engines can achieve running speed more quickly, and are cleaner and more reliable than diesels.

--electrification will provide a significant opportunity to use an energy source which is not petroleum based. It will enable a part of the transportation systems to rely on coal, nuclear and hydro produced power instead of of diesel fuel.

All of these advantages can lead to large cost savings for railroads--and ultimately for shippers and the consumer.

enegineering studies have demonstrated that the cost savings of electrification will more than pay the cost of the project, but because there are more pressing needs for the limited capital a railroad can raise, these projects have been put on a back burner by railroads.

A Government-Industry Task Force on electrification recently analyzed the possibilities for electrification of American railroads and found 6,200 route miles where it would be clearly profitable. That study was completed before the Energy Crisis and the doubling of fuel costs that have hit many railroads.

The economies of electrification are widely agreed upon. They include locomotives with longer useful lives, lower maintenance and operating costs, higher reliability and greater overload capacity, shorter trip times and greater flexibility of speed, and energy from coal-fired power plants.

A technical study perpared for the Government-Industry Task Force on Electrification translated many of these advantages into substantial cost savings for the nation's railroads. Based primarily on 1971 data the study found it would be economical to electrify some 6,200 miles of the 14,300 mile heavy density system it analyzed. After allowing for a substantial return on investment, amortization of capital, and other expenses, the study

concluded there would be a saving of $360 million (discounted to the present) resulting from electrification.

Since the benefits of electrification are sensitive to changes in fuel prices--which have skyrocketed since the oil embargo--it is assumed that most of the nation's 14,300 mile heavy density freight network would now qualify for electric operation. The Rail Trust Fund would earmark $3.1 billion over six years for these projects.

No Need For "Orange Lines"

With passage of the Regional Rail Reorganizational Act of 1973 a philosophy of retrenchment and tinkering, of dismantlement and merger, of cheap and simplistic solutions became the national policy towards railroads. It was a compromise among strong and divergent views where competing interests were not reconciled, and as constitutional challenges proceed through the courts there is widespread belief that the RRR Act will be ruled unconstitutional and sent back to Congress.

The first official action under the RRR Act was publication of "Rail Service in the Midwest and Northeast Region" by the U. S. Secretary of Transportation, a report that embraced the philosophy of dismantlement by recommending elimination of 25 percent of that region's

REGIONAL RAIL REORGANIZATION ACT OF 1973

WILL NOT SOLVE RAILROAD PROBLEMS

The Regional Rail Reorganization Act of 1973 does not provide a solution to the plight of the presently-bankrupt railroads in the Northeast-Midwest Region.

The Act provides a minimum of $500 million for rehabilitation and modernization of Eastern District railroads. An additional $1 billion is provided which may be used for rehabilitation and/or acquisition of rail properties although it is likely that most of this money will be used for acquisition.

By almost unanimous agreement among the railroads, government and private transportation analysts, this is not enough money to do the job. The FRA-sponsored maintenance deficit study by Thomas Dyer, Inc., examined railroads representing 83 percent of the track mileage in the District and found a maintenance deficit that would cost $2.1 billion to correct. Expanding this to cover all Eastern District carriers raises the total to $2.6 billion.

Penn Central has estimated a current deficit of $562 million for their proposed 15,000 mile core system alone. Add to this their estimate of $156 million for maintenance of equipment deficiency and $565 million for needed service improvement expenditures and the total comes to $1,283 million.

Using these figures the First National City Bank analysis of the proposed Conrail system estimated it would suffer a total capital deficiency of just under $2 billion which it would have to try to raise in the capital markets. This included capital requirements of $3 billion for acquisition and working capital and new equipment.

More important than the accuracy of this estimate by City Bank is the fact that it represents a strong vote of no-confidence in Conrail by the private financiers and effectively closes off private capital as a source of rehabilitation and modernization funds.

Summary of First National City Bank
Estimate of Projected Cash Requirements
and Authorized Financing of Conrail
(Millions of 1974 Dollars)

Cash Requirements	
Maintenance of Way Deficit	$562
Maintenance of Equipment Deficit	156
Service Improvements	565
New and Rebuilt Rolling Stock	1,010
Working Capital	300
Sub-Total	2,593
Acquisition	3,000
Total Requirements	5,593
Authorized Sources	
Debt	1,100
Common Stock (for acquisition)	2,500
Total Sources	3,600
Deficit to be financed from private Sector	(1,993)

Source: Affadavit of John W. Imgraham, First National City Bank, before PennCentral Reorganization Court June 10, 1974, pp. 10, 13.

There is a second lesson in this analysis--that wholesale abandonment of light density branch lines will not restore the railroads' financial health. The City Bank estimate of capital requirements--which assumed one out of every four miles of Penn Central track would be abandoned--found a total capital requirement of $2.5 billion--one billion more than the total authorization under the Regional Rail Reorganization Act--just for roadbed, facilities Equipment and working capital. Even with wholesale abandonment the Rail Act will not revitalize the bankrupt railroads.

rail mileage. (These lines were shown on maps in orange and thus became the infamous "orange lines" to the public.)

In one step the Department of Transportation made it appear that low density branch lines are the fundamental cause of railroad financial problems. Rail users along these lines who have received the poorest service, have had the most difficulty obtaining cars when they need them and have been the worst victims of slow-orders and reduced frequency of service, were cast as economic vampires who rob the system of its vitality.

Even Penn Central managers, who requested ICC permission to abandon 5,000 miles of track in 1973, proposed no such drastic abandonments as a solution to that railroad's financial problems. And Penn Central only claimed that abandonment of these 5,000 miles of lines would result in "a net annual benefit of $20 million," a fraction of that railroad's annual losses.

Publication of the Secretary's Report caused a public outcry and has created a distrust of federal railroad planners that will take years to overcome. Few railroaders believe that massive abandonment of branch lines will effect important savings, while community and business leaders know that abandonment can cause substantial economic hardship.

Among some observers there is the undocumented belief that if railroads in the northeast region had modern yards, track and rolling stock the apparent losses of branch lines would all but disappear. When the Penn Central, the railroad with the most ambitious abandonment program, claims such meager savings, the argument gains plausibility.

The Rail Trust Fund can return attention to the more urgent issues facing railroads. It is intended as a solution to both mainline and branch line needs, and it does not depend on abandonments for its success.

As a matter of credibility, the Rail Trust Fund must contain protections for branch line rail users. For example, an agreement by a railroad that it will not process contested abandonments for two years after receiving a Trust Fund grant should provide a balance to competing interests and preserve today's rail system until it is modernized and operating efficiently. Then the viability of low density branch lines can be properly evaluated.

COPYING AN IDEA THAT WORKS: THE HIGHWAY TRUST FUND

Throughout the debate on ways to preserve good rail service, the most troublesome issues have been financial. How much public money is to be spent? Where will it come from?

These agruments have been made more rancorous because they all assume that there will not be enough money to rehabilitate and modernize the nation's railroad system. And if there is too little money, there are interested parties--owners and trustees of railroads, shippers and receivers of goods, creditors, and public officials who regulate operations--who have strongly conflicting views about how it should be spent.

Yet the undeniable success of the Highway Trust Fund demonstrates that it is possible to raise all of the money needed to modernize the railroads, to do so with a simple, widely-understood method, and without a drain on the Federal budget.

The Rail Trust Fund builds on this lesson from the Highway Fund--and not on the common premise that a "cheap" solution to the nation's rail problems is all that can be afforded. It began with a calculation of the size of the job facing American railroads,

just as the planners of the Interstate Highway System began by estimating the size and cost of a major road system for the nation.

Once the scope of the job was calculated for bringing American railroads to modern standards, a schedule of work and means of financing were addressed--again, just as planners of the Interstate Highway System had done.

By earmarking highway user taxes on fuel, tires, accessories and the like, Congress created secure funding for that highway system. And the Highway Trust Fund has grown over the years from about $2 billion in 1958 to about $6 billion currently.

The Rail Trust Fund unabashedly copies this idea by proposing a user surcharge on the freight bill paid to railroads and earmarked for a special Rail Trust Fund. The size of the charge was derived from the size of the job that must be done and it is to be paid by those who will benefit from improvements--rail users.

Thus, like the Highway Trust Fund, the Rail Trust Fund will not be an additional drain on the public treasury.

Because the money is needed for immediate rehabilitation and modernization of existing rail facilities, not for planning, acquisition and construction of new routes, the Rail Trust Fund differs slightly from the Highway Trust Fund. Expenditures will be largely completed in its first

six years and paid for over 30 years like other public improvements, rather than being paid for out of current revenues like the Highway Trust Fund.

But the many similarities between the Rail Trust Fund and the Highway Trust Fund are intentional. A simple solution that the public understands is necessary for today's rail problems, and a successful pattern like the Highway Trust Fund is more readily understood than a new complicated formula.

Above all, the rail using public has become suspicious and wary of complicated solutions that lead to reduced rail service. After the extensive hearings on the Department of Transportation's "potentially excess" rail lines, legislative proposals that include provisions for massive abandonments will not find easy public acceptance.

The Rail Trust Fund solution, like the Highway Trust Fund, is predicated on the provision of more and better rail service, not less, and it creates a financing scheme for attaining that laudable objective.

POTENTIAL RAIL TRUST FUND BENEFITS

Railroad revitalization achieved through the Trust Fund investments undoubtedly will result in dramatic Improvements in the finances of the nation's railroads. It will also produce significant cuts in railroad operating costs which can be shared by the carriers, shippers and ultimately the consumer.

At the very least these savings will provide a cushion against inflation-induced price rises. In some cases they will lead to actual cuts in the cost of providing rail service, in shippers' inventory costs, and in the final cost of products.

Lower costs, more efficient railroad operations and modern equipment will also lead to improved levels of rail service, enabling carriers to attract larger shares of business than they have at present.

Electrification alone can produce gigantic ssvings. The Cost-Effectiveness Review of Railroad Electrification study prepared for the FRA estimated a cumulative saving of $360 million discounted to the present by electrifying 6,200 miles of rail. Clearly there are substantial additional savings possible merely by removing slow orders, fixing track and improving equipment utilization.

The Trust Fund also holds promise of a significant boost to railroad revenues. For example, in the Eastern District modal splits for rail shipment for specific commodities

Table 1

Potential Benefits of Trust Fund on Railroad Operating Accounts

- Millions of Dollars -

	Actual Operating Accounts, 1972	Potential Savings Factor	Adjusted Operating Accounts 5% Added Freight Revenue	Adjusted Operating Accounts 10% Added Freight Revenue
eight Revenues	12,187		12,796	13,406
erating Revenues	13,176		13,785	14,395
perintendence	236	5%	224	224
spatching	64	5%	61	61
rd Clerks and Crews	1,172	5%	1,113	1,113
ain Crews	1,321	5%	1,255	1,255
earing Wrecks	41	15%	35	35
mages	229	15%	195	195
juries-Transportation	1.26	15%	107	107
comotive & Car Repair	1.345	2%	1,318	1,318
Sub-Total	4,534		4,308	4,308
TAL Operating Expenses	10,530		10,304	10,304
erating Ratio	79.9		74.8	71.6

TE: Actual data from ICC, Transport Statistics in the United States, 1972, Tables 160, 161; Labor items are adjusted to include share of employe health and welfare benefits.

RAIL TRUST FUND IS A GOOD REMEDY FOR INFLATION

The Rail Trust Fund--a program of prudent investment--is a good prescription for the economic ills of double digit inflation.

Railroads are so basic to the nation's economy that the economy cannot prosper while the railroad industry is ill. Huge unnecessary costs have been added to the nation's transportation bill because of poor track, archaic yards and terminals, and poor utilization of freight cars. These costs can be reduced drastically by increasing investments in the railroads.

Capital made available through the Rail Trust Fund will allow clearing the maintenance deficit, modernizing yards and terminals, and rebuilding roadway. Electrification will allow significant operating economies and encourage sharing of facilities-- and costs-- by freight and high speed passenger service. The Rolling Stock Revolving Fund will provide financing for rolling stock and motive power purchases.

Lower operating costs to the railroads will be one result of this program. A second result will be increased reliability which will allow shippers to plan their output more efficiently and to cut back on inventories--and their carrying costs.

All of these factors will work to slow the tendency to rising prices in the economy.

Nor will Trust Fund expenditures themselves be

inflationary. Compared with gross private sector investment of more than $200 billion and a Federal budget of $300 billion a year, Trust Fund outlays are indeed small. The $818 million called for in the first year of the program is only 0.4 percent of overall investment outlay in the nation.

and distances are often much less favorable to rail than in other districts. This may be attributed directly to the deteriorated condition of many of the Eastern railroads-- most notably the bankrupt Penn Central. Rehabilitation of track and streamlining of operations might well shift these splits to favor rail. The potential market for rail service is substantial. The Task Force on Productivity cited data which indicated that many large shipments moving by truck in excess of 200-250 miles might move more economically by rail. Since the revenues generated by these movements in 1968 were nearly $5 billion, this represents a very large potential market for rail service.

Specific estimates of cost savings and revenue increases which could be produced by the Rail Trust Fund require detailed studies beyond the scope of this presentation. However, some idea of the potential for such changes--and their impact on the financial condition of the nation's rail carriers--may be gleaned from an examination of the composite revenue and expense accounts compiled by the ICC.

Table I presents some of these data for 1972. While the adjustments to railroad operating accounts illustrated are purely hypothetical, they do demonstrate the dramatic shifts possible in the railroads' financial condition by a modernization program.

Actual operating accounts selected were those most sensitive to change through the effects of a Rail Trust Fund. Had the railroads been operating an efficient, modern plant with sufficient rolling stock in 1972, it would not be at all unreasonable to have expected five to ten percent more freight revenues than those actually collected. Substantial savings would have been possible in such accounts as clearing wrecks and damages to property and freight. Smaller, but significant savings would have been possible in many of the other transportation accounts.

One key indicator of the changes possible is the operating ratio (the ratio of operating expenses to operating revenues). Railroad analysts generally agree that a ratio of about 70 would provide railroads with healthy earnings, the ability to raise capital in private markets, and to expand investments in their rail operations. Not since the end of World War II have railroads approached this operating ratio; in the mid-1950's it approached 75, and has since trended upward to 79.9 in 1972.

Table I indicates that relatively small improvements in revenues and small decreases in selected costs could affect major changes in the operating ratio. These savings and five percent more freight revenue could generate an operating ratio of about 75, a level not seen in almost 20 years. A ten percent increase in freight revenues would mean a ratio of 72, a better performance than the

A second area of large potential savings in the future is possible through better freight car utilization. Shippers argue that the nation's freight car fleet--1.7 million cars in 1973--should be augmented by up to 100,000 units to alleviate car shortages. There is no doubt that more cars are needed--and the Trust Fund would provide low interest loans for their purchase--but track rehabilitation, modernization of yards and electrification should produce significant increases in car utilization, thus relieving railroads of part of the additional car purchases.

If, for instance, Rail Trust Fund-induced improvements bring about a three percent increase in car utilization, a 100,000 car deficit would be halved to 50,000 units. This, in turn, would obviate the need for railroads to purchase 50,000 cars, thus saving them $127.7 Million a year in fixed charges. (This assumes an initial cost of $20,000 a unit financed at 9.5 percent for 15 years.)

Since the nation's railroads had fixed charges of $596 million in 1972, and income after fixed charges of only $342 million this potential saving would indeed have a significant impact on the railroads' future income statements.

Such a radical turnabout in railroad finances,

improved rail service, and lower railroad costs are not the products of a pipe dream. They can be the products of a prudent investment program--sponsored and guided by the public--but without any direct cost to government. This, then is the Rail Trust Fund proposal.

Operating The Rail Trust Fund

Here is how the Rail Trust Fund would operate:

1. Railroads would collect and pay into the Fund a five percent surcharge on freight revenues;
2. Trust Fund outlays would be funded by issuing government-backed obligations and would be paid back over 30 years via the surcharge;
3. All railroads would be entitled to Trust Fund grants for rehabilitation and modernization projects in proportion to their surcharge collections;
4. A revolving loan fund would be available to finance rolling stock purchases.

Over the first six years, the Trust Fund would spend $12.5 billion for rehabilitation, electrification and modernization of the nation's rail system. The surcharge would be sufficient to finance these outlays, related administrative costs, and make the Fund self-sustaining. At the end of the six year period, additional modernization projects could be scheduled; or the Fund could become self-liquidating with a gradual reduction in the surcharge as its debt is retired.

The Revenue Surcharge

The five percent surcharge on freight revenues would be collected and forwarded to the Fund by all railroads.

This would be sufficient to capitalize the multi-billion dollar expenditures needed to finance rehabilitation and modernization of the nation's rail network, electrification of heavy density interstate lines, and acquisition of new freight cars and locomotives.

The surcharge need not be an additional burden on shippers. Rather, half of the temporary ten percent surcharge approved by the ICC in June 1974, could be re-directed to the Fund. This would be consistent with the original intent of the ICC surcharge to provide money for capital improvements and deferred maintenance.

Such a method of collection would have no adverse effect on railroad balance sheets. Unlike the ICC-approved surcharge, it would not be diluted by increased tax liabilities on the part of carriers.

For shippers, on the other hand, the surcharge would be an ordinary business expense and would be partly offset by a reduction in income taxes. Ultimately, the costs of rehabilitation and modernization would be borne partly by rail users and those who use products shipped by rail and partly in the form of tax revenues foregone.

THE RAIL TRUST FUND: A GIANT STEP BEYOND THE ICC TEMPORARY SURCHARGE

The Rail Trust Fund presents at least four advantages over the temporary surcharge recently imposed by the ICC:

1) It allows railroads to finance improvements to road and structures with no adverse effect on already tight operating accounts. Under present ICC accounting regulations, railroads are forced to finance many improvements as operating expenses even though these improvements may have a useful life of 30 years or more.

Further, under the ICC order the 10 percent surcharge is not entirely available to the railroads since it appears on the railroad income statement and part of it may be required to pay additional tax obligations incurred because of the addition to revenue.

2) Because Trust Fund expenditures are capitalized over a long period, a modest surcharge will provide billions of dollars for improvements over a very short time. The ICC's 10% surcharge will not. Based on 1973 freight revenues a five percent surcharge paid into the Fund could capitalize $8.6 billion (at 7 percent and 30 years) while the ICC's 10 percent surcharge would yield only $1.38 billion. The massive dose of capital which the railroads need will be provided only via the Trust Fund.

3) Because of their eneven earnings and huge maintenance deficits, most railroads have had their access to private capital choked off. The Trust Fund's Rolling Stock Revolving Loan Fund will provide a source of low-cost capital for rehabilitation and purchase of rolling stock. The ICC order provides no such mechanism.

4) The Trust Fund mechanism insures that given amounts of money are spent on rehabilitation and modernization projects on a continuing basis, and it accomplishes this in a straightforward manner. By contrast, the ICC's 10 percent rate increase order is temporary, and railroads receiving this boost in revenues may be under strong pressure to spend it to meet rising costs not directly related to rehabilitation. Indeed, several railroads have petitioned the Commission to reconsider its order on the grounds that tight cash situations will not allow them to appropriate it entirely to maintenance and capital improvements. Rail users are now paying a 10 percent premium with the understanding that this additional money will be used to improve their rail service. They deserve a guarantee that their payments will be used for this purpose--and the Trust Fund would provide such a guarantee.

Trust Fund Outlays

Outlays would be funded by issuing government-backed obligations. Since they would be capitalized over a long term, outlays would not be strictly limited to current income of the Fund. This means that the rehabilitation-modernization programs so desperately needed by the railroads could be completed in a short period of time--perhaps five or six years--rather than over a decade or more.

Initially, Trust Fund expenditures would be available to meet needs in four broad areas. They might be spent as follows:

Rehabilitation of Road and Track	$6.7 billion
Electrification	$3.1 billion
Modernization and Expansion of Roadway and Structures	$1.8 billion
Modernization of Yards	$0.9 billion
Total	$12.5 billion

This allocation results from the estimates of current needs which were described in the previous section. It could be revised as a result of further analysis once the Trust Fund is operating.

Each year the Trust Fund would authorize outlays in each area to meet needs and keep pace with the railroads' ability to use them effectively.

In any year, most of the Fund outlays (say 90 percent) could be apportioned to the railroads in proportion to their contributions to the Fund the previous year. The remaining outlays could be allocated among railroads regardless of contributions. Such a procedure would maintain the balance between the railroads' reluctance to subsidize their competitors and the public obligation to address the greatest needs.

Every railroad would receive an annual entitlement to a share of the 90 percent based only on that railroad's share of surcharge collections the previous year. This money would not be earmarked for specific categories, but could be used for any approved rehabilitation or modernization project. Thus a railroad with little or no maintenance deficit would still be entitled to funds to pay for yard modernization or electrification. It would not be penalized because it had no maintenance backlog to correct.

Railroads Design Projects

Railroads themselves would design projects and apply to the Fund for money subject to the annual Trust Fund earmarking. They would thus set their own priorities for rehabilitation and

modernization projects within the broad limits of the earmarked funds. If one railroad wished to emphasize yard modernization it could do so, while another might emphasize electrification.

Financing Rolling Stock

As part of the Trust Fund, a Rolling Stock Revolving Fund would be created to finance railroads' purchases of new and rebuilt freight cars and locomotives. Source of money for the Rolling Stock Fund would be a deferred capitalization fund created by the excess of the five percent surcharge not needed for amortization of Trust Fund debt in the early years.

All railroads and their jointly-owned car pooling companies would have a line of credit of up to $1 billion against the Rolling Stock Fund in the first two years. This could be increased in subsequent years as the sinking fund grows. Railroads could borrow for rolling stock purchases, repaying over periods of 15 years in the case of new equipment, and over shorter periods for rebuilt equipment. Loans would be secured by liens against the equipment to be held by the Trust Fund.

Since funds would be drawn from the Trust Fund surplus, interest charges could be scaled to match the overall yields on government-backed obligations of similar life. As an average, the railroads might pay seven percent plus administrative costs. The $1 billion line of credit would be enough to finance from 20,000 to 40,000 new cars and 750-2,000 locomotives.

Railroad Obligations

Railroads would maintain full ownership of all projects undertaken with money from the Fund. They would also be required to maintain any work financed through the Fund to minimum standards, thus insuring that once a stretch of track, the railroads carries out regular maintenance to prevent the accumulation of another maintenance deficit. Railroads which fail to meet this requirement would temporarily lose eligibility for receiving Trust Fund money. Upon returning track or structures to these minimum standards they would regain eligibility.

Railroads also would be required to agree to a two year moratorium on abandonments in all cases where shippers or the public raise a legitimate objection. Light density lines have never been a large source of railroad losses, and at the end of this period, after

the Trust Fund outlays have begun to improve service and reduce costs, these light density lines could be re-examined to determine whether continued service is warranted.

Financial Viability

Will the Trust Fund work?

Table 2 summarizes the sources and uses of Funds as envisioned in the Trust Fund proposal. It illustrates the operation over the first six years and leaves no doubt that the Trust Fund will be viable.

The five percent revenue surcharge will produce income more than sufficient to capitalize Trust Fund outlays, pay administrative costs and build up a fund for use in rolling stock purchases.

Financial viability was also analyzed under a wide range of inflation and freight revenue growth forecasts. Trust Fund viability is not dependent on particular forecasts and in fact the Fund is viable even in the "worst case" when inflation outstrips revenue growth by a wide margin.

The essentials of the financial viability analysis are summarized below for a "base case" which assumes moderate inflation and moderate growth in freight revenues. Further details are contained in the technical appendix.

Proposed Sources and Uses of Funds All Districts - 5% Surcharge
Moderate Inflation, Moderate Growth in Rail Revenues
- Millions of Current Dollars -

	Constant $ Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 7
Uses									
Ties	3239	324	686	725	767	812	420	3734	
Rail	2535	254	537	569	602	636	330	2928	
Electrification	2566	-	272	575	609	804	832	3092	
Yards & Terminals	800	80	169	179	189	200	104	921	
Other Road and Structures	1600	160	339	358	379	401	207	1844	
Total	10740	818	2003	2406	2546	2853	1893	12519	
Sources									
Annual Surcharge at 5%		761.9	834.2	906.4	978.6	1050.8	1162.9		1275.4
Annual carrying charge at 7½%		69.3	170.0	203.7	215.6	241.6	160.3		1060.0
Cumulative carrying charge		69.3	238.8	442.6	658.1	899.7	1060.0		
Annual Surplus		692.6	595.3	463.8	320.5	151.1	102.9		
Interest 1974-9 on surplus at 7%		346.8	239.7	144.1	72.1	21.9	7.2		
Deferred Capitalization Fund								3158.0	
Annual Capitalization Interest									221.1
Addition to Capitalization Fund									436.5

NOTE: Inflation on expenditures assumed to be 5.8% annual average 1974-8 and 3.5% 1979+ (Source: NPA Inflation for Non-Residential Fixed Investment, Economic Projections Series 73-N-1, Table ix-1). Totals may not add due to rounding

Uses of Funds

The proposed uses of Trust Fund outlays are summarized in the first half of Table 1 . The first column represents the present cost of meeting railroad maintenance and capital requirements. Assuming that the outlays are staggered over a six year period, and adjusting them for increases in the costs of labor and materials (assumed to average 5.4 percent annually over the period) they will total $12.5 billion.

Essentially the "uses" section of Table is built up from the previous anaylsis of investment needs. Each category is expensed over the six year period at a different rate. For instance, the maintenance deficit is assumed to be worked off at a rate of 10 percent of the total the first year, and 20 percent in subsequent years. Electrification, which has a long lead time for design and acquisition of materials, is not actually undertaken until year two, and outlays increase until 25 percent of the total work is undertaken in years five and six.

This base case analysis also assumes a moderate rate of inflation, 5.8 percent annual average in 1974-78 and 3.5 percent in 1979. This is the implicit price deflator for non-residential fixed investment

used in national economic forecasts by the National Planning Association in 1973-74 (The U.S. Economy: 1973 to 1983). Detailed analysis of an alternative "worst case" presented in the technical appendix indicates that the Trust Fund will be viable under a wide range of inflation rates.

Sources of Funds

The second half of Table 2 summarizes the sources of funds over the six year period.

The first line shows Trust Fund revenues yielded by the five percent surcharge, assuming 1974 as the base year. In this case, revenues the first year (1974) would total $761.9 million, growing to $1,275.4 million in year seven. The 11.2 percent average annual growth rate for the 1974-80 period implicit in this analysis is somewhat higher than freight revenue growth in recent years. It is, however, derived from national projections of the U. S. economy and is not grossly different from various other projections of freight revenue. (For instance, the most recent forecast of Penn Central revenues produced by their consultants in March, 1974 implies a 10.1 percent annual average growth in revenues in the 1974-78 period). Furthermore, analysis indicates

that the Trust Fund would be viable under a wide range of growth rates in freight revenues. A detailed discussion of these points is contained in the technical appendix.

Line two of the table shows the carrying charge needed to capitalize Trust Fund outlays for 30 years at 7½ percent annual interest. Thus in year one the Fund would lay out $818 million. The carrying charges on this amount total $69.3 million. For this analysis it is assumed that the Fund obligations actually would be sold for seven percent, with the extra half percent added on to cover the costs of operations.

In year two the Fund would lay out an additional $2,003 million, the added carrying charges would be $170.0 million, and the cumulative carrying charges for the total debt outstanding would come to $238.8 million. At the end of year six these cumulative charges would total $1,060.0

Line four, annual surplus, represents the difference between the surcharge income and cumulative carrying charges. This surplus accrues to a deferred capitalization fund and earns interest (assumed to be seven percent annually). The deferred fund and interest in turn, provide reserves and the cash for the line of credit provided to railroads through the Rolling Stock Revolving

Fund. This line of credit can total $1 billion in the first two years and increase in subsequent years as the deferred capitalization fund grows. At the end of year six, the deferred fund totals $3,158.0 million and generates $221.1 million in annual interest.

Thus the Rail Trust Fund will work. A moderate surcharge on freight revenues will generate multi-billion dollar investments to rehabilitate our nation's railroads--in a matter of years, rather than decades--and without any direct commitment of public funds.

TECHNICAL APPENDIX

This section describes in detail the needs estimates and analysis of Trust Fund financial viability. Investment needs were estimated for the maintenance deficit, electrification, yard and terminal modernization, modernization of other roadway and structures, and rolling stock purchases. The financial analysis sought to determine whether a five percent surcharge would be sufficient to make the Trust Fund viable under a range of assumptions of inflation and growth in freight revenues.

A. Maintenance Deficit

The maintenance deficit refers to the deficiency in railroad roadway created by decades of under-replacement of ties and rail. Since tie and rail replacement are charged to railroad operating expenses, even though once purchased they have long lives, they have been prime candidates for "economies" and "cost cutting." These items are a significant part of railroad operating expenses (direct expenses for track maintenance in 1972 totaled 7.5 percent of overall operating expenses), and because of their long life, skimping on tie or rail replacement in any one year will have little measurable impact on operations. Over the long term, however, the impact can be disastrous as track deteriorates and slow orders and derailments mount.

A detailed study of the maintenance deficit on 25 of the nation's Class I railroads recently done by Thomas K. Dyer, Inc., for the Federal Railroad Administration formed the basis for the maintenance deficit estimates used here. The Dyer study compared actual rail and tie replacements on each railroad over the 1933-1972 period with estimates of rail and tie requirements. Annual replacement requirements were calculated for each railroad by estimating tie and rail life based on physical characteristics (e.g. average system weight of rail) and use (average system gross ton miles). The results varied by railroad and over-time, but overall, the average tie life of 33.4 years and two position rail life of 54.2 years was not greatly different from the standards suggested by the AAR in the so-called ASTRO Report (The American Railroad Industry: A Prospectus, 1970).

Table [illegible], summarizing the annual tie installations and the share of installations to requirements, is taken directly from the Dyer study. Tables [illegible], summarizing the main line rail installations and requirements, were calculated from data provided in the Dyer study. Actual replacements over the period were "aged" by calculating life remaining and the results (tie years and rail ton years) were compared with that required by a normalized maintenance standard. The latter assumes that 50 percent of the original life of all track materials in the system remains at any one point in time. These calculations resulted in estimates of 100.8 million ties and 3.8 million tons of new rail needed for the 25 railroads to correct the maintenance deficit of the 1933-1972 period.

These figures from the Dyer study were expanded to all Class I railroads by using the ratio of track miles in the 25 studied to track miles in all railroads. This yielded a deficit of 141.9 million ties and 5.3 million tons of rail.

Next, 1974 unit costs of replacing cross ties and rail used in the Dyer study were compared with independent estimates based on AAR cost accounting guides and recent spot materials prices. The Dyer study cross tie replacement cost of $19.47 (including all labor and materials) was slightly higher than the independent estimate ($18.78). The Dyer study also included an add-on for replacing bridge and switch ties which averaged 12.8 percent of the unit cost of cross tie replacement. This reflected an average of about one switch and bridge tie for every 14 cross ties and the higher installation costs of switch and bridge ties. The rail replacement cost of $450 to $525 per ton was higher than the independent estimate of $430. Thus, the Dyer study estimates of the cost of erasing the maintenance deficit seem liberal.

The results of the Dyer study are summarized as follows:

		Deferred Maintenance		
District	Miles of Track	Ties (000,000)	Rail (000,000)	Total (000,000)
East	87,200	$1,000	$1,100	$2,100
West	111,100	1,300	600	1,900
South	38,000	--	100	100
Total	236,300	$2,300	$1,800	$4,100

If the Dyer study results are expanded to all Class I railroads the total cost of correcting the maintenance deficit comes to $3,239 million for ties and $2,535 for rail. The Rail Trust Fund proposal envisions spending this money over a six year period, with 10 percent of the deficit erased in the first year, 20 percent in years two through five, and 10 percent in year six. In the tables summarizing sources and uses of funds the maintenance deficit outlays were distributed over six years including an inflation factor for each year.

Table F 6

Unit (Per Mile) Costs of Electrification

1. Costs (1968-69 Dollars) Per Track Mile	$
A. Catenary	53,750
B. Substations	10,000
C. Electrical Distribution	1,250
D. Signalling (Standard CTC to Electric)	11,500
E. Communications	6,700
F. Other Costs (Bridges, Tunnels, Etc.)	1,202
G. Total Cost Per Track Mile	84,402
2. Cost Adjustment to 1974 Dollars	X 1.215
3. Total Costs Per Track Mile, 1974 Dollars	102,548

Note on Method:

All cost data from Edison Electric Institute, Railroad Electrification (N.Y.: 1968) cited in Federal Railroad Administration, Cost-Effectiveness Review of Railroad Electrification, April 1973. Cost adjustment factor for

1969-73 from National Planning Association, Economic Projection Series 73-N-1, Table IX-1, implicit price deflator for producers durable equipment. For 1973-74, an additional eight percent inflation is assumed.

B. Electrification

The cost of electrifying the heavy density rail network was based on data presented in the recent FRA-sponsored study, Cost-Effectiveness Review of Railroad Electrification, and Edison Electric Institute, Railroad Electrification.

Based on these sources, a unit cost of electrifying roadway was developed. (See Table 6). This includes all costs of constructing catenary, substations and the distribution system, modifying signalling and communications for compatibility with electric operation, and modifying bridges and tunnels as needed. It does not include the costs of acquiring electric locomotives since these estimates cannot be made without a detailed examination of operating conditions.

The unit costs represent an average of costs for the East, Midwest, South and West, as presented in the cost-effectiveness study. They were increased by 21.5 percent to reflect inflation in the 1969-74 period. This adjustment factor represented the actual change in the price index of fixed investment in producers durable equipment, 1969-73, and an estimated increase of eight percent in 1974.

The high density network with the greatest potential for electrification was assumed to be the 14,300 route mile system analyzed in the recent FRA-sponsored report. That report found benefits in electrifying some 6,200 miles of the system, but based on present high petroleum costs and expected growth in rail traffic in coming years, the entire network was assumed to have some potential for electrification. In the first years, the Trust Fund could limit its outlays to those segments which are part of the 6,200 miles, expanding electrification as feasibility studies dictate.

Total cost for the electrification projects was derived simply by multiplying the per mile cost ($102,548) by the route mileage (14,300) by 1.75 (the assumed ratio of track to route mileage in the network). The result, $2,566 million in current dollars, would be spent in years two through six, with 10 percent spent the second year, 20 percent in years three and four, and 25 percent in years five and six. Because of the need for design time, no outlays would be made the first year. The expected outlays presented in the sources and uses tables have been adjusted to reflect inflation.

C. Modernization of Yards, Terminals, and Other Roadway and Structures

Many of the greatest inefficiencies and much of the unnecessary cost in the railroad industry can be traced to yards and terminals. In many of the large metropolitan areas, old, scattered terminals lead to disproportionate costs of originating and terminating freight. High per diem rental payments for cars and under-utilization of the nation's freight car fleet can also be traced to yard and terminal inefficiencies.

Additions and improvements to roadway are another area where railroads have underinvested. Some routes, often laid out a hundred years ago, contain steep grades and curves which slow the movement of traffic and often require added motive power (with consequent added costs). Modern construction techniques can eliminate many of these bottlenecks, but this requires investment--an item in extremely short supply in the rail industry of late.

While there is general agreement within the industry that yard and terminal modernization and improvement of roadway and structures are much needed, there is little hard data to indicate the costs of such a program. Estimates used in the Trust Fund proposal were based on an examination of the relationship between capital expenditures for roadway and structures and railroad output (measured as gross ton miles) over the 1950-1973 period.

TABLE 4

Gross Capital Expenditures for Roadway and Structures

Class I Line Haul Railroads
-Millions of Dollars-

Year	Current $	Deflator	Constant $	Billions of Gross Ton Miles	Constant $ / GTM
1950	286	74.4	384	1524	.2520
1951	363	80.4	451	1618	.2787
1952	406	82.6	492	1575	.3124
1953	402	84.0	478	1558	.3068
1954	322	84.8	380	1429	.2659
1955	341	86.7	392	1578	.2484
1956	406	92.4	439	1613	.2722
1957	387	97.9	395	1555	.2540
1958	258	100.0	258	1412	.1827
1959	250	104.7	239	1467	.1629
1960	286	102.9	278	1460	.1904
1961	219	103.4	212	1431	.1481
1962	240	104.1	230	1487	.1547
1963	259	104.5	248	1535	.1616
1964	277	105.7	262	1603	.1634
1965	327	107.5	298	1666	.1789
1966	399	110.1	362	1754	.2064
1967	374	113.8	329	1726	.1906
1968	368	117.5	313	1783	.1755
1969	421	123.0	342	1827	.1872
1970	358	130.2	275	1842	.1493
1971	314	136.3	230	1805	.1274
1972	368	139.6	264	1933	.1366
1973	449	144.9	309	2054	.1504

SOURCE: Current dollar expenditures and gross ton miles from Association of American Railroads, Economics and Finance Department, Washington, D. C.; deflator for non-residential fixed investment from U. S. Department of Commerce.

Annual gross capital expenditures data from the AAR were converted to 1958 dollars using the deflator series for non-residential fixed investment developed by the U.S. Department of Commerce. This series was chosen in preference to more specific deflators (e.g. those for public utilities construction or producers durables) because of the very diverse nature of roadway and structures expenditures. Gross ton miles were used to represent railroad output--or work done.

Table A summarizes rail capital expenditures in roadway and structures in the period 1950-1973. While the outlays in current dollars show an uneven pattern, they seem to indicate an expansion of investments in the late 1960's and early 1970's.

However, the constant dollar equivalents show a very different picture. Expenditures in the 1960-73 period averaged $284 million annually, compared with $437 million in the 1950-54 period--a decrease of one-third.

In the absence of detailed cost studies, the Rail Trust Fund proposal assumed that railroad expenditures for roadway and structures improvements in constant dollars should be the same per unit of output as they were in the more prosperous 1950-54 period. It should be noted that this was a period characterized by a high level of rail and tie replacements and lower operating ratios than in recent years.

The actual calculation was made by multiplying the 1950-54 average expenditure per billion gross ton miles ($0.2832) by the 1973 gross ton miles (2,054 billion) and multiplying by the deflator (1.449). This yields a figure of $843 million which was assumed to represent the average level of new investment needed in roadway and structures. Since railroads actually invested $449 million from their own sources in 1973, the difference, or $394 million, represents the amount the Trust Fund should provide. If this is expanded to cover six years, the total (in 1974 dollars) is $2,364 million.

Since capital expenditures often change quite a bit from year to year, a similar calculation was made for the 1971-73 period and it yielded a six year total of $2,430 million which was quite close to the first. For the sake of simplicity, this was rounded to $2,400 over the six year period.

In the sources and uses of funds tables, one-third of this, $800 million, is assumed to go for yards and terminals, and the rest for other roadway and structures.

As with other classes of expenditures, modernization funds would be spent over a six year period. The cost analysis assumes that 10 percent would be spent in year one, 20 percent in years two through five, and 10 percent in year six, with adjustments made for the effects of inflation.

It should be noted that outlays in these two areas will supplement basic outlays for rehabilitation of track in

existing yards and terminals and for electrification of heavy density routes. Thus, in many cases, investments in yards and main lines would qualify for funding from more than one Trust Fund category.

It should be noted that the results of this analysis were not very different from those in the ASTRO Report which recommended a doubling of current capital expenditures for roadway and structures over the 1970-1980 period.

D. Rolling Stock purchases

In 1973, more than 59,000 new and rebuilt freight cars and almost 1,400 locomotives were installed by the nation's railroads. Continued acquisition at or above this level can be expected in the future, although a number of factors make accurate forecasts of needs difficult.

The difficulty of forecasting car and locomotive needs is illustrated by comparing present fleets with the needs forecast in the ASTRO Report published by the AAR in 1970. The nation's freight car fleet which totaled 1.7 million units at the end of 1973 falls between the 1977 and 1978 ASTRO needs estimates while the locomotive inventory of nearly 27,500 matches the ASTRO forecast for 1975-76. Yet, shippers are still complaining vigorously about the current shortage of rolling stock.

Growth in business, more efficient car and engine utilization due to track and operating improvements, and changes in the nature of business--all of which may be induced by the Trust Fund--influence the need for increased rolling stock.

TABLE A-8

Rolling Stock Shortage

Table [illegible] summarizes data on the car shortage as reported by the AAR and ICC. The average monthly shortage in the 12 months ending April 1, 1974, was almost 35,000 cars. At current car prices each $1 billion in Rolling Stock Revolving Fund credit would finance 20-40,000 cars (and 750-2,000 locomotives). While this is in the same range as the reported car shortage, it is substantially less than the annual retirement of 80,000 units assumed in the ASTRO Report.

In a word, then a $1 to $2 billion line of credit will make a significant--but only a partial contribution to car shortages. Improved utilization and continued financing through conventional sources will be required to eliminate the chronic problem.

II. Trust Fund Income and Financial Viability

This section describes the financial viability analyses made of the Trust Fund proposal. This analysis was undertaken in two parts. First a base case was defined with moderate inflation and moderate growth in freight revenues. Next, a "worst case" was analyzed. This case assumed high inflation and low growth in revenues--a combination which, in the extreme, could deny the self-liquidating feature of the Trust Fund.

The following assumptions underly both cases:

1) Initial estimate of Trust Fund outlays of $10,740 million in 1974 dollars

2) Annual surcharge of five percent of gross freight revenues

3) Annual carrying charge of 7.5 percent (7 percent 30 year obligations and ½ percent to cover administrative costs)

4) Surplus and deferred capitalization fund earn interest of 7 percent.

In addition, the base case assumed the following:

1) Moderate inflation at 5.8 percent annual average in the 1974-78 period and 3.5 percent in 1979-80. This corresponds to the implicit deflator for non-residential fixed investment in the National Planning Association's Economic Projections for 1973-74 (73-N-1 Table ix-1)

2) Growth in freight revenues averaging 11.2 percent annually over the 1974-80 period. Freight revenue projections were made using a rather simple method and have no claim to high accuracy; they are, however, consistent with other freight revenue projections for the period.

The worst case assumed:

1) An inflation rate 50 percent above that in the base case, or 8.7 percent annual average in the 1974-78 period and 5.2 percent in 1979-80.

2) A freight revenue growth factor 50 percent lower than that used in the base case,

averaging 5.0 percent over the 1974-80 period. Freight revenues for the worst case were calculated for each year by using one-half of the growth factor for the base case revenues for that year.

Taken together, the worst case assumptions mean that the inflation rate is almost 75 percent higher than the growth in revenues--an extreme but highly unlikely situation which would occur only if there were a high rate of inflation and an almost complete inability of railroads to make up in revenue for any increased costs.

Table A9 presents the results of the worst case analysis.

The high inflation assumption means that the cost of meeting railroad needs in future years grows considerably compared with the base case. Thus, total outlays of the Trust Fund in the first six years would be 13,503 million, vs.12,519 million in the base case.

Low revenue growth means that the Trust Fund income from the surcharge comes to only $991.4 million in year seven compared with $1,275.4 million in the base case.

Even under these circumstances, however, the Trust Fund is self-liquidating. Although the cumulative carrying charges exceed surcharge yields in years five and six by $63.5 and $197.6 million respectively, surcharge yield plus the interest from the deferred capitalization fund are more than enough to pay the carrying charges. In year seven the surplus of surcharge

Proposed Sources and Uses of Funds All Districts - 5% Surcharge
High Inflation, Low Growth in Rail Revenues
- Millions of Current Dollars -

	Constant $ Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	Year 7
Uses									
Ties	3,239	324	704	765	832	904	476	4,005	
Rail	2,535	254	552	600	652	709	373	3,140	
Electrification	2,566	--	279	607	660	897	944	3,387	
Yards & Terminals	800	80	174	189	205	223	121	992	
Other Road and Structures	1,600	160	348	378	411	447	235	1,979	
Total	10,740	818	2,057	2,539	2,760	3,180	2,149	13,503	
Sources									
Annual Surcharge at 5%		761.9	798.1	832.7	865.9	897.8	945.7		991.4
Annual carrying charge at 7½%		69.3	174.2	215.0	233.7	269.2	182.0		
Cumulative carrying charge		69.3	243.4	458.4	692.1	961.3	1143.3		1143.3
Annual Surplus		692.6	554.7	374.3	173.8	(63.5)	(197.6)		
Interest 1974-9 on surplus at 7%		346.8	223.3	116.3	39.1	(9.2)	(13.8)		
Deferred Capitalization Fund								2236.8	
Annual Capitalization Fund Interest									156.6
Addition to Deferred Capitalization Fund									4.7

NOTE: Inflation in expenditures assumed to be 50% greater than in base case: 8.7% annual average 1974-1978 and 5.2% 1979+. Revenue growth rate assumed to be 50% lower than in base case: 1974-1979 annual average is 5.0%. Totals may not add due to rounding.

plus capitalization fund interest less cumulative carrying charges leaves $4.7 million as an addition to the capitalization fund. In sum, even in the unlikely case that inflation far exceeds growth in rail freight revenues, the Trust Fund remains self-liquidating.

Inflation Rates

Trust Fund calculations used the price deflator for non-residential fixed investment. The historical series was that developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA Series 8.1 as revised). Deflators for the 1974-80 period were those used in National Planning Association's forecasts of the U.S. economy in the 1973-83 period (Report 73-N-1, February 1974).

There is no single deflator which can reflect accurately price changes in the highly diverse mix of labor, capital and materials which the Trust Fund would finance. Examination of price changes among the components and changes in the various deflators, including those for producers durables, public utility construction, wholesale prices and GNP, led to the choice of the non-residential fixed investment deflator as reflective of price changes of broad investment-type expenditures.

Freight Revenue Projections

The Trust Fund base case assumes an annual average growth in freight revenues of 11.2 percent over the 1974-80 period. This was derived using a rather simple estimating procedure. It makes no claims to high accuracy. However,

its results are consistent with those of more elaborate projection techniques. Furthermore, Trust Fund viability is not dependent on a specific rate of freight revenue growth.

This estimate was made by projecting the historical relationship between gross product originating in rail and rail freight revenues. Constant dollar GPO-rail projections were those of the National Planning Association, Economic Projection Series (Report 73-N-1, Table VII-2). The implicit price deflator for GPO-rail was projected based on its historical relationship to the GNP deflator and used to derive current dollar GPO-rail estimates for the 1974-80 period. These then were used to derive a rail freight revenue estimate based on a least squares projection of the freight revenues to GPO-rail relationship (projected growth in the latter was constrained to half of that which would result from an ordinary least squares projection). The resulting revenue projections were as follows:

Year	U.S. Freight Revenues - Millions of Current Dollars
1973 (actual)	13,794
1974	15,238
1975	16,683
1976	18,127
1977	19,572
1978	21,016
1979	23,258
1980	25,508

These projections are not very different than other recent forecasts of revenues for the rail industry. One

of these is the continuing program of traffic and revenue projections of the Penn Central system developed by Temple Barker & Sloane, Inc. The most recent of these, completed in March 1974, forecasts a growth in freight revenues for the full Penn Central system from $1,879.2 million in 1974 to $2,637.3 in 1978. (See Affadavit of Carl S. Sloane before the Penn Central Reorganization Court, Debtor No. 70-347, March 25, 1974, hearing). This represents an average annual growth rate of 10.1 percent compared with 9.5 percent for the Trust Fund estimates for this period. Given the fact that Penn Central is currently bankrupt and also serves the slower-growing Eastern District, the Trust Fund revenue forecasts seem conservative.

The Trust Fund projections were also compared with those contained in the 1972 National Transportation Report of the U.S. Department of Transportation which forecast 1980 freight revenues of $14,510 in 1969 dollars (See pp. 109-111). If the annual growth factor of 2.8 percent implied in this forecast is applied to actual 1973 revenues, the result is a forecast of $16,822 million by 1980 (in 1973 dollars). If one assumes freight rate increases of 5.25 percent a year in this period to capture rising costs, the result is a forecast of $24,067 for 1980 (in current dollars). This is about six percent less than the Trust Fund estimate for that year.

TABLES A1 - A5

CROSSTIE AND RAIL REPLACEMENT 1933-1972

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